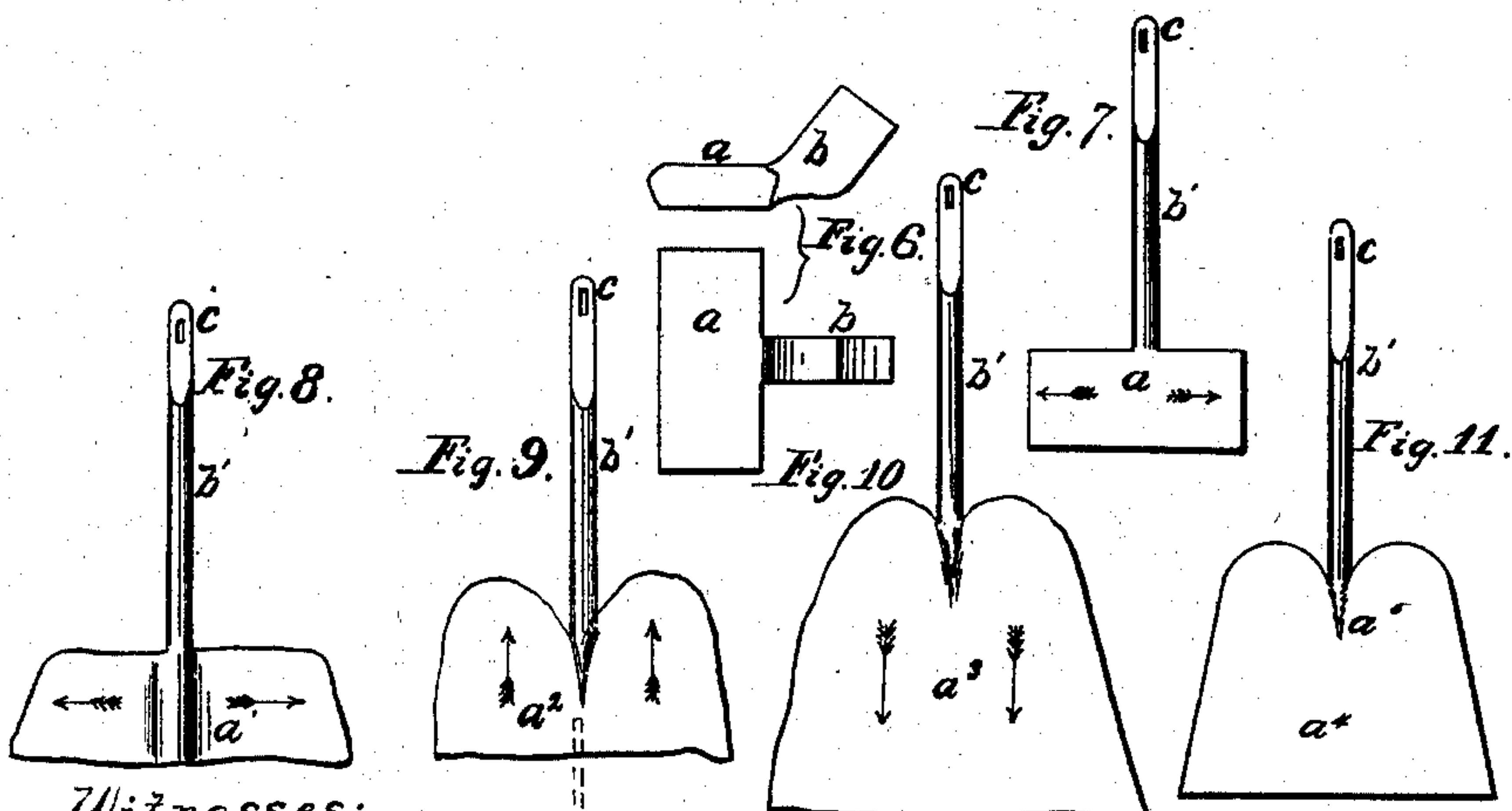
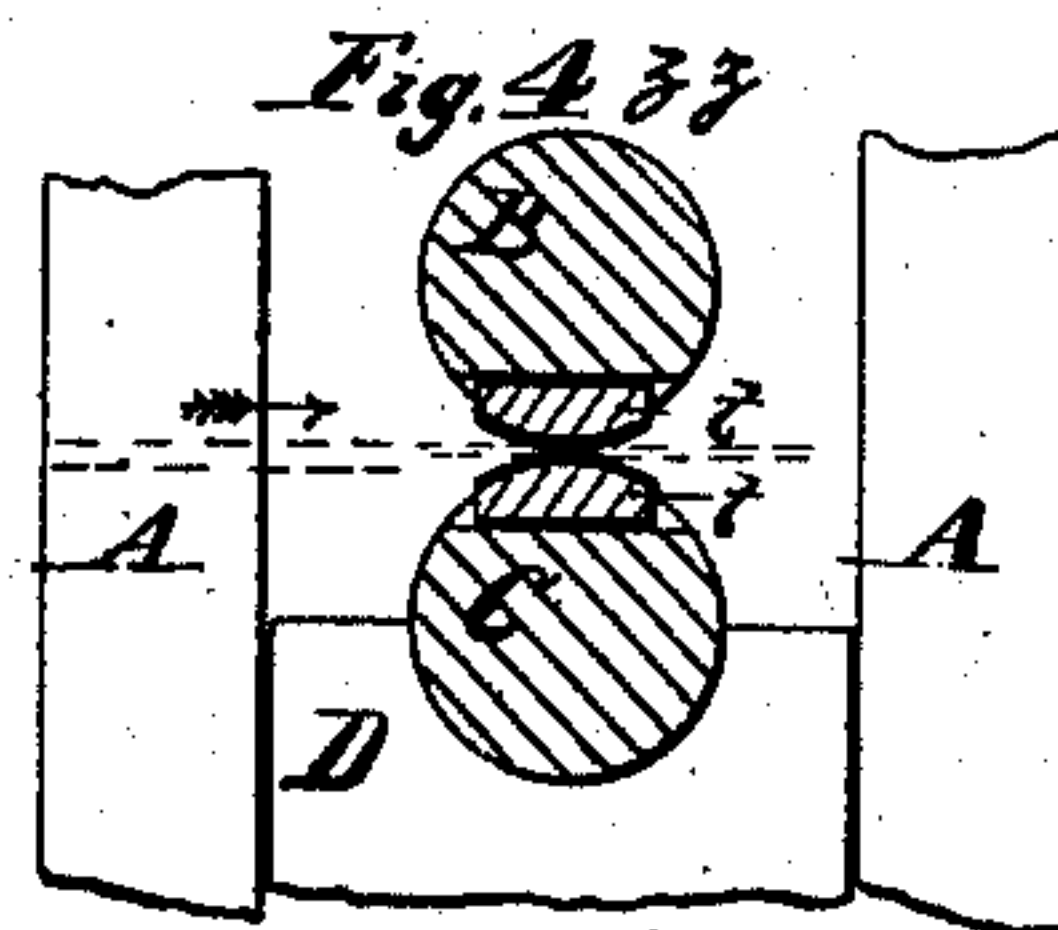
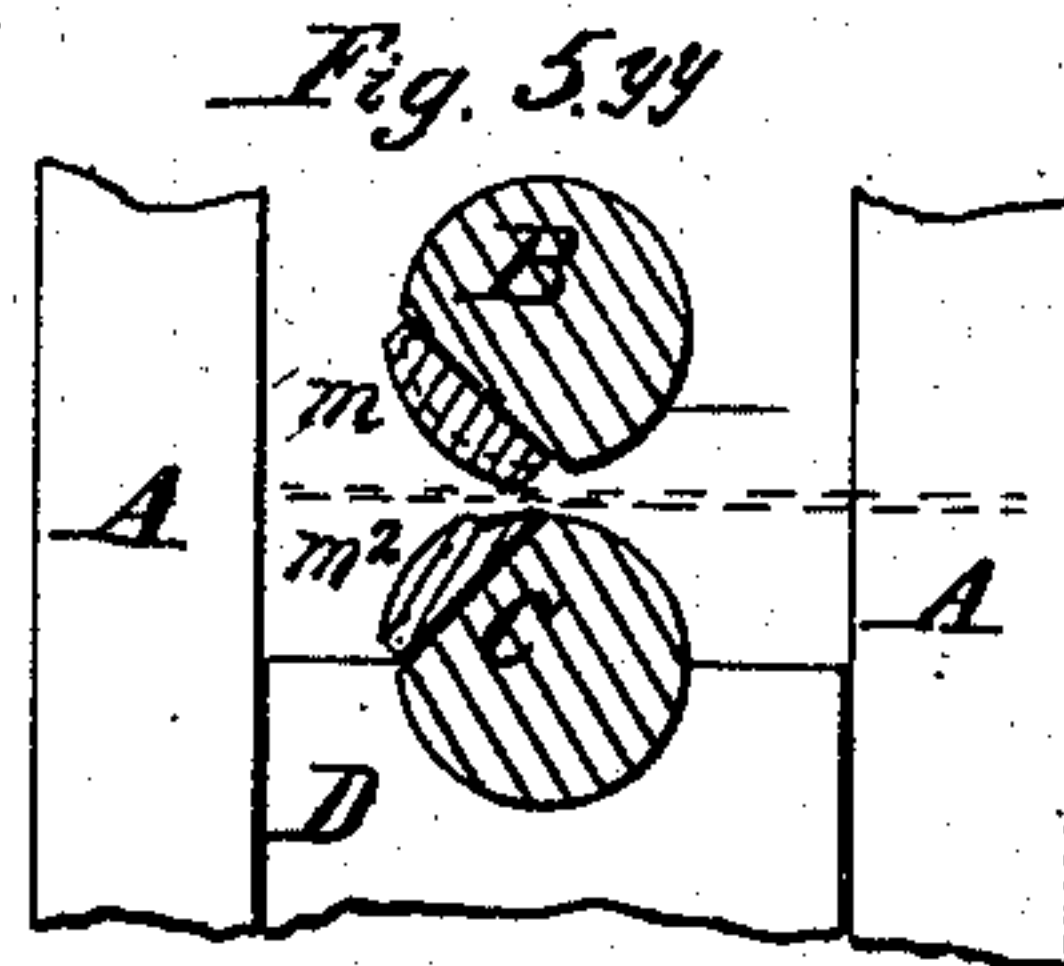
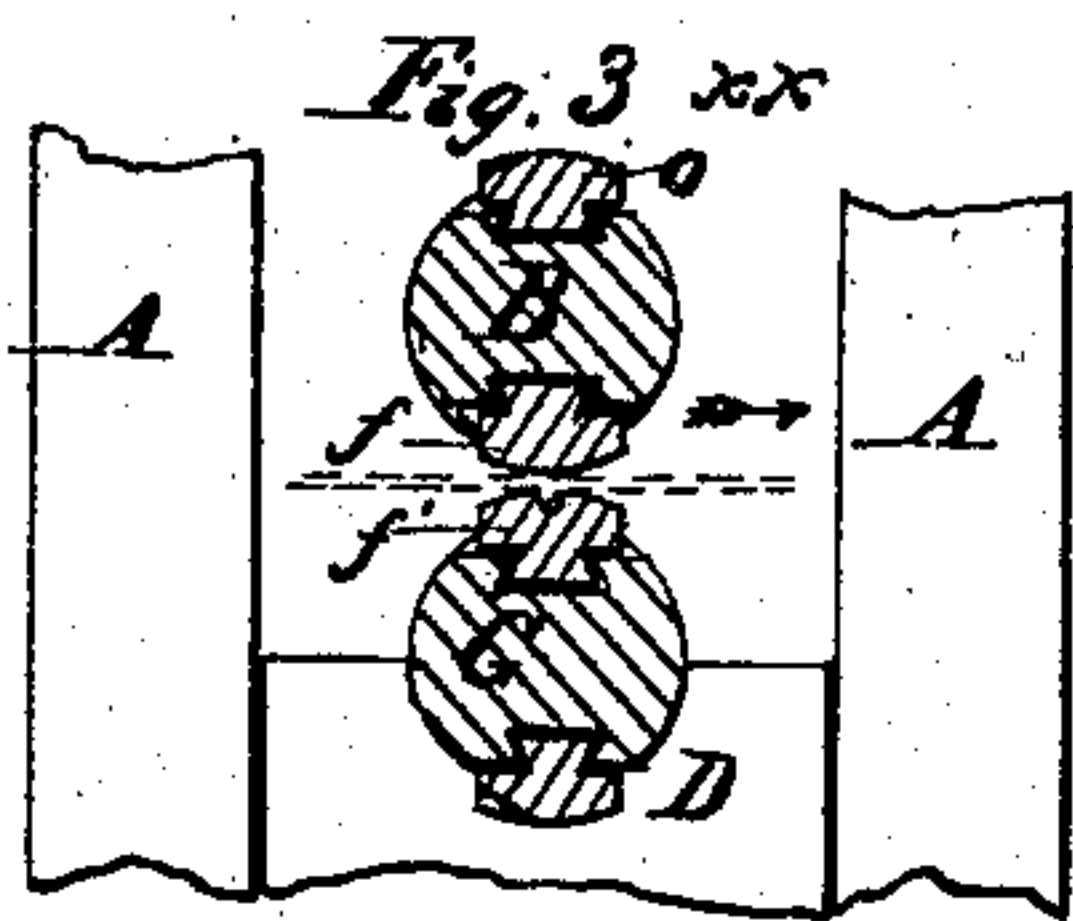
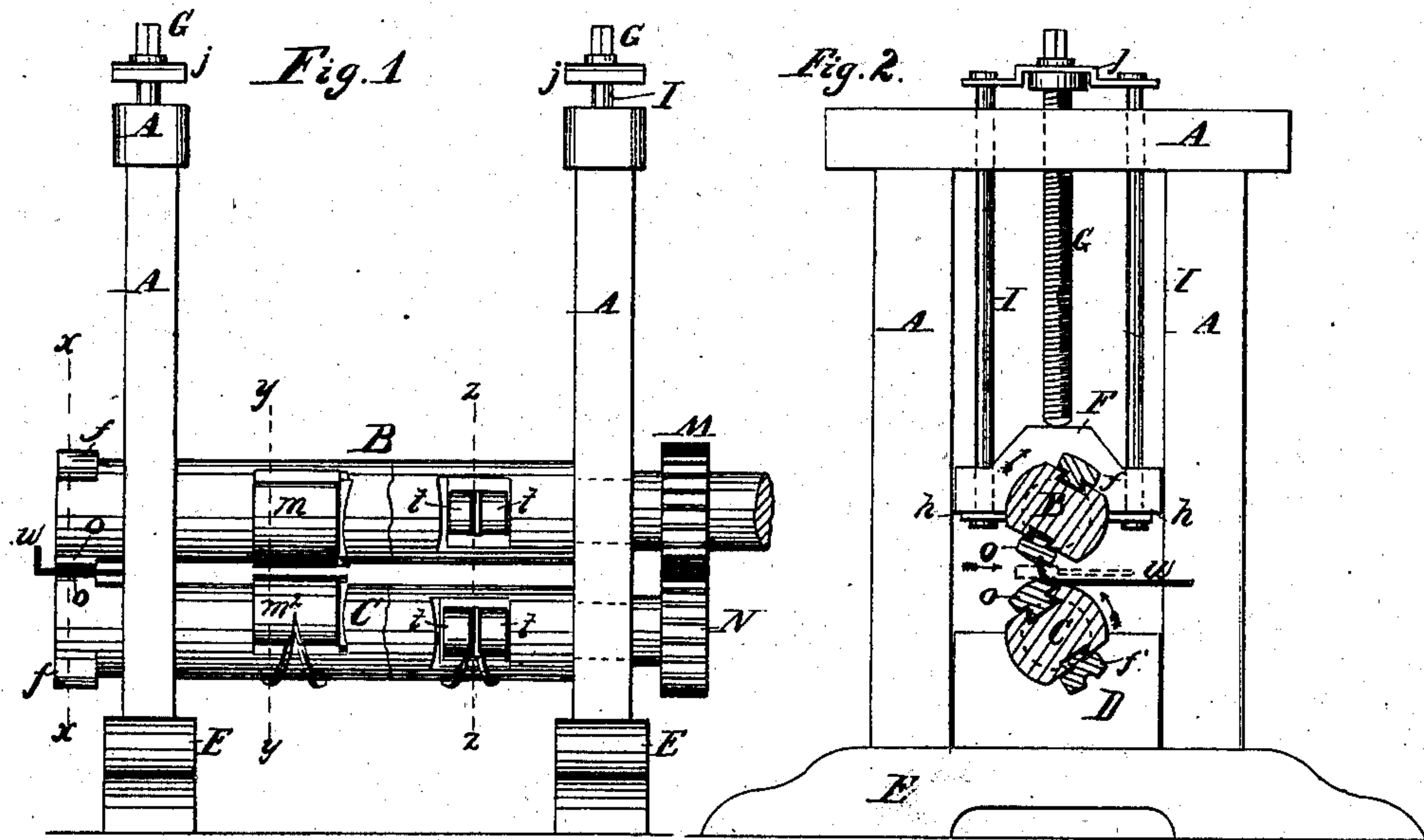


S. A. MILLARD.
PROCESS OF ROLLING HOES.

No. 74,570.

Patented Feb. 18, 1868.



Witnesses:
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United States Patent Office.

S. A. MILLARD OF CLAYVILLE, NEW YORK.

Letters Patent No. 74,570, dated February 18, 1868.

IMPROVED PROCESS OF ROLLING HOES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, S. A. MILLARD, of Clayville, of Oneida county, in the State of New York, have invented certain new and useful Improvements in the Process of Rolling Hoes; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this application.

My invention relates to a new and useful improvement in the process or method of rolling out hoe-blanks into hoes in the manufacture of goose-neck hoes, (in which the head and shank are formed of one piece of metal.)

Previous to my invention it has been customary, in the manufacture of this kind of hoes, to either draw the blank out into shape under a trip-hammer, or to "spread" and "plait" out the blank under oscillating rolls. In the process of hammering out, considerable time and expense are involved, as a great number of "heats" have to be taken to complete the blank into a hoe, while in the process of rolling between dies, in oscillating-rolls, (though more economical than the hammering process,) the difficulties are encountered of upsetting the stock imperfectly to form a good "head," (where the shank joins the blade,) in "spreading" the blank, and of creasing and imperfectly upsetting the stock of the blade in "plaiting," both of which serious objections (which give rise to great imperfection in the article produced) are consequent mainly to the system practised heretofore of rolling the blanks back and forth, (or alternately from and toward its centre,) and the impracticability of making and working a set of dies on oscillating-rolls, without having more or less slip or back-lash, and consequent tearing of the fibres of the stock operated upon.

To overcome the difficulties heretofore encountered in rolling hoes, and to produce a better article, are the objects of my invention, which consists in "spreading" the blank between dies working in rotary rolls, by rolling the stock alternately in opposite directions, from near the centre of the blank toward the edges, and then forming the ears and plaiting out the blade, by alternately rolling the blank during its whole length, alternately in opposite directions between rotary sets of dies, as will be hereinafter more fully explained.

To enable those skilled in the art to fully comprehend my new process of rolling hoes, I will proceed to describe it more fully, referring to the accompanying drawings, in which I have illustrated my process, and shown a means by which I am enabled to practise it. In the accompanying drawings

Figures 1, 2, 3, 4, and 5 are elevations and sections of a machine which I have successfully employed in carrying out my new process or method of rolling hoes, and which I have made the subject of a separate Letters Patent, in the specification of which will be found a full description of the construction and operation of said machine.

At Figures 6, 7, 8, 9, 10, 11, I have shown the hoe-blank, as it is worked up into shape by the successive operations of my new system, or process of rolling, which may be thus described:

The blank, made in the usual form, as seen at fig. 6, and after having its shank drawn out, as seen at fig. 7, is taken to the machine, with the portion *a* properly heated, and is introduced between the dies *o o*, (arranged in the overhanging ends of rolls B C,) one half at a time, in such manner as to be spread from the centre outward into the shape seen at fig. 8. This operation of spreading is illustrated at fig. 2, where the blank is shown in red as having had one half spread, and been reversed, or turned over, and inserted between the dies, (on a rest, W,) which are just about to catch it and spread the other half. The dies *o o* are so shaped that the spread blank has a bulge or superfluity of stock left at its middle, (as indicated by the shaded portion at fig. 8,) out of which is formed the head, and which thicken up the blade around the head to strengthen the hoe. This head portion *a'*, (see fig. 11,) is finished into shape by passing the blank through the dies *f f*, (see fig. 3,) and by the subsequent operations. The blank is now passed between the dies *t t*, (as shown at fig. 4,) in the direction indicated by the arrows, (see fig. 9,) which spreads up the ears *e e*, and leaves the blank in the shape seen at fig. 9. In performing this operation upon the blank, it is held by the tongs, as indicated by the blue lines at fig. 9, and, being shoved through between the rolls B C, is caught between the dies *t t*, as they come together, and rolled back toward the operator; the said dies being formed with grooves through their centres, as shown, to permit the blank to pass through without having its shank or even the middle portion of the blade touched. The lower die *t* is provided with a guide for adjusting the blank, as the operator puts it through in the tongs,

so as to insure the placing of the blank in such position as to have the dies not touch the middle part of the blank. The blank (in the shape seen at fig. 9) is now passed between the dies $m m^2$, and is plaited or rolled out from the shank toward the edge, (in the direction indicated by arrows at fig. 10.) In performing this operation, the operator shoves the blank through between the rolls edge foremost, and allows the dies to catch the blank at the ear portion, (as seen at fig. 5,) and roll it out toward the edge, as illustrated by the arrow, fig. 5. The blank is now completely rolled, and is afterward cut out in shape, as seen at fig. 11, straightened, polished, handled, &c., for the market.

It will be seen that the several operations under the rotary dies may be performed with a very economic expenditure of fuel, since the operative, having the furnace close to the mill, will have only to slightly reheat the blank after its first heat to complete the rolling operations, and it will be understood that, by the process described of spreading the blank from near the centre alternately each way, as indicated by arrows at fig. 7, (and illustrated on the machine at fig. 2,) the stock is left sufficiently thick near the middle of the blank to insure the formation subsequently of a perfect bead and a strong form of blade. The operation of spreading up the ears, (as illustrated at fig. 4,) with the dies t , might be performed by a pair of plain dies, arranged in the overhanging ends of the rolls, and by turning the blank over, and pressing each side separately through dies; but I deem the mode shown of carrying out my process (by means of the grooved dies $t t$) the most desirable. The die m^2 is made with a score, of course, to accommodate the bead, and should be provided with a centring-guide, as shown, (and fully described in my other specification, before mentioned,) to insure the proper placement of the blank in the dies, in performing the plaiting-out operation.

It will be seen that, in each of the various stages of my process or method of rolling, the stock is rolled entirely in one direction, and in the direction in which the stock is to be spread out; and it will be understood that a piece of metal rolled out in this manner (into the given shape for a hoe) will present a better and more even surface, and that its texture will be better than if it were put between rolls, squeezed, and rolled back and forth by an oscillating motion of the dies.

Having explained my new process or method of rolling hoes, what I claim therein as new, and desire to secure by Letters Patent, is—

Forming the bead and blade portions of a hoe, by rolling the stock out between rotary dies, in the manner substantially as described, that is to say, by rolling the stock alternately from near the centre toward each edge, so as to "spread" the blank, and then alternately lengthwise in one direction to form the ears, and lengthwise in the other direction to draw or plait out the blade toward its edge.

In testimony whereof, I have hereunto set my hand and seal, this 18th day of July, 1867.

S. A. MILLARD. [L. S.]

Witnesses:

B. F. LEWIS,
B. F. ROBERTS.